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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,508	11/20/2003	Mitsuya Komamura	040894-5978	5620

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EXAMINER	
KURR, JASON RICHARD	

ART UNIT	PAPER NUMBER
2615	

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/716,508	<b>Applicant(s)</b> KOMAMURA, MITSUYA	
	<b>Examiner</b> Jason R. Kurr	<b>Art Unit</b> 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/20/03 1/24/05 8/16/06</u> | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Krone et al (US 6,064,326).

With respect to claim 1, Krone discloses a delta-sigma modulator (fig.6 #60) that shifts quantization noise of a digital audio signal to a high-frequency band to reduce noise of the band of the digital audio signal, the delta-sigma modulator comprising: a quantization bit rate detecting unit (fig.6 #67, fig.7 #80) configured to detect a quantization bit rate of the digital audio signal (col.7 ln.9-15); a volume setting value detecting unit (fig.6 #67, fig.7 #81) configured to detect a volume setting value of the digital audio signal (col.7 ln.16-19); a filtering unit configured to have plural sets of filter coefficients having different shaping properties and allow the quantization noise to pass (fig.6 a0-a2,a0'-a2'); and a filter coefficient switching unit (fig.6 #68a-c) configured to switch the filter coefficients of the filtering unit in accordance with the detection result of the quantization bit rate detecting unit and the detection result of the volume setting value detecting unit (col.7 ln.27-44).

With respect to claim 2, Krone discloses the delta-sigma modulator according to claim 1, wherein: the filter coefficients include a first coefficient set (fig.6 a0-a2) and a

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second coefficient set (fig.6 a0'-a2'); an order of the first coefficient set is lower than that of the second coefficient set (col.7 ln.51-62); and the filter coefficient switching unit switches the filter coefficients to the first coefficient set when the quantization bit rate is equal to or less than a predetermined number (col.7 ln.19-44).

With respect to claim 3, Krone discloses the delta-sigma modulator according to claim 1, wherein: the filter coefficients include a first coefficient set (fig.6 a0-a2) and a second coefficient set (fig.6 a0'-a2'); an order of the first coefficient set is lower than that of the second coefficient set (col.7 ln.51-62); the filter coefficient switching unit switches the filter coefficients to the first coefficient set when the quantization bit rate is equal to or greater than a predetermined number and the volume setting value is equal to or greater than a predetermined value; and the filter coefficient switching unit switches the filter coefficients to the second filter coefficient set when the quantization bit rate is equal to or greater than the predetermined number and the volume setting value is less than the predetermined value (col.7 ln.19-44).

With respect to claim 4, Krone discloses the delta-sigma modulator according to claim 1, wherein: the filtering unit includes a memory (fig.7 #80), which stores the quantization noise; and when the filter coefficient switching unit switches the filter coefficients, contents of the memory are reset (col.7 ln.15-16).

With respect to claim 5, Krone discloses the delta-sigma modulator according to claim 1, wherein: the filtering unit includes a memory (fig.7 #80), which stores the quantization noise; and when the filter coefficient switching unit switches the filter

coefficients so that an order thereof becomes larger, contents of the memory are reset (col.7 ln.15-16).

With respect to claim 6, Krone discloses the delta-sigma modulator according to claim 1, wherein: when the volume setting value is changed and gain rises, the filter coefficient switching unit switches the filter coefficients near the point in time when the rising starts; and when the volume setting value is changed and gain falls, the filter coefficient switching unit switches the filter coefficients near the point in time when the falling ends (col.7 ln.9-26).

With respect to claim 7, Krone discloses a method of switching a delta-sigma modulator (fig.6 #60), the method comprising: detecting a quantization bit rate of a digital audio signal (col.7 ln.9-15); detecting a volume setting value of the digital audio signal (col.7 ln.16-19); and switching filter coefficients in accordance with the quantization bit rate and the volume setting value (col.7 ln.27-44).

With respect to claim 8, Krone discloses a digital amplifier comprising a delta-sigma modulator (fig.6 #60) that shifts quantization noise of a digital audio signal to a high-frequency band to reduce noise of the band of the digital audio signal, wherein the delta-sigma modulator includes: a quantization bit rate detecting unit (fig.6 #67, fig.7 #80) configured to detect a quantization bit rate of the digital audio signal (col.7 ln.9-15); a volume setting value detecting unit (fig.6 #67, fig.7 #81) configured to detect a volume setting value of the digital audio signal (col.7 ln.16-19); a filtering unit configured to have plural sets of filter coefficients having different shaping properties and allow the quantization noise to pass (fig.6 a0-a2,a0'-a2'); and a filter coefficient switching unit

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(fig.6 #68a-c) configured to switch the filter coefficients of the filtering unit in accordance with the detection result of the quantization bit rate detecting unit and the detection result of the volume setting value detecting unit (col.7 ln.27-44).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Wellard et al (US 5,012,244) discloses a delta-sigma modulator with oscillation detection and a reset circuit.

Cusinato et al (US 6,621,435 B2) discloses a method and circuit for improving the signal/noise ratio of a sigma-delta modulator.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason R. Kurr whose telephone number is (571) 272-0552. The examiner can normally be reached on M-F 10:00am to 6:30pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 273-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JK

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